alfred benesch & company
CONSULTING ENGINEERS
233 NORTH MICHIGAN AVENUE, CHICAGO, ILLINOIS 60601
312/565-0450

June 23, 1982

Mr. William A. Bowers
Unsafe Building Enforcement Officer
City of Hammond
7324 Indianapolis Boulevard
Hammond, Indiana 46323

Subject: Calumet Container Corporation
Investigation of Incinerator and Stack

Dear Mr. Bowers:

Alfred Benesch & Company is pleased to submit this letter form report of our investigation of the subject facility as called for in our Agreement dated June 18, 1982.

Mr. John B. Dolio, President, Dolio and Metz, Ltd., and I visited the site on Friday, June 18, 1982, with Mr. William Burgess, Building Commissioner, City of Hammond, to inspect the condition of the incinerator and stack. The following is a summary of our observation.

INCINERATOR

Description. The incinerator, or burn-off section, consists of two parts, a cylindrical element and a rectangular box. The rectangular box is located below the stack, while the cylindrical element extends from the box outward to the loading platform.

The incinerator is open ended. Containers are carried through the incinerator on a conveyor. Gas burners supply the heat for incineration through 4 ports in the cylindrical element; two adjacent to the entrance end and two at the approximate center of the unit. Combustion air is blown into the open ends of the incinerator to prevent the escape of gases into the building.

The cylindrical element consists of an outer steel shell fabricated from a railroad tank car, with the ends cut off, and an inner steel shell about 2 feet less in diameter. The ends of the annular cavity between the shells is sealed with welded plate steel. This cavity is partially filled with water to provide a cooling jacket.

The inner steel cylinder is further protected in areas by a fire brick lining. From the evidence of pressure relief valves and gauges, the water jacket is not an open system operating at atmospheric pressure, but rather a closed one that is capable of generating steam and steam pressure.

The cylindrical element, which could weigh as much as 100 tons is supported by 4 groups of 2 pipe columns. These pipe columns are supported on the walls of a concrete trough that supports and guides the conveyor chain on its return.

The rectangular box located below the stack is a single wall steel plate box. It has no structural function, but acts as a transition chamber between the horizontal cylindrical incinerator and the vertical cylindrical stack.

Observations. The outer shell of the cylindrical element shows signs of extensive corrosion on the surface. The pipe column supports also are severely corroded, especially at the base where they are exposed to the hot liquid in the trough.

The plates joining the ends of the two steel cylinders, to seal the water jacket, have welds of questionable capacity. Other welds, particularly on the inner shell, were not visible for inspection. The fire brick lining of the inner shell is in generally poor shape: bricks are loose, broken or missing. Its ability to function as insulation for the shell is very limited and spotty.

The rectangular element is fabricated from miscellaneous steel plates; one wall is a checkered floor plate. There are numerous holes, and there is a gap at the juncture of the stack and the top plate.

STACK

Description. The vertical element of the incineration operation is approximately 40 feet tall. It is supported on a structural steel frame above the incinerator. The frame in turn is supported on 4 steel columns. The stack is about 5 feet in diameter for the bottom 2/3 of its height, while the upper ten feet is about 2 feet in diameter. The stack is a steel plate cylinder lined with refractory cement. In the lower portion of the stack, the afterburner section, ports were cut in 3 places for the installation of gas burners to supplement the incineration.

Observations. The structural steel of the stack and supporting members is extensively rusted. There is evidence of warping of some areas and some members, caused either by the heat of the fire or the heat of the operation. The juncture of the stack and the incinerator has seperated. There are open gaps thru which gases of the incineration process could readily escape.The cement lining of the stack appears generally intact, but due to inadequate lighting a close inspection could not be made.

The structural steel frame supporting the stack was obviously fabricated from salvaged steel and the connections, while apparently functioning satisfactorily, are questionable. Due to the debris surrounding the area it was impossible to determine on what the stack columns were founded. The stack probably weighs about 30 tons and should have a sizeable footing under each column.

WORK TO BE PERFORMED

If the incinerator and stack are to be returned to operation, numerous examinations and tests would have to be made since the incinerator and stack are not a manufactured product, but an assembly of components. For one, the incinerator apparently was operating as a fired pressure vessel and should meet the ASME Code requirements and the State of Indiana Code before being again placed in operation. Secondly, the incinerator must also be supported safely and its weight of approximately 100 tons requires a suitable foundation.

Among the specific items of work which would have to be performed are the following:

1. In the absence of plans, measurement of the size and thickness of all members for use in preparing "as-built" drawings;

2. Excavation above and around the foundation to determine the size and capacity of the footings;

3. Samples of the structural steel, from critical points and including portions of welds, should be taken and tests made to determine:
   a. tensile strength;
   b. crystalline structure;
   c. chemical analysis; and
   d. suitability for high temperature conditions.

4. A thorough inspection of the lining to determine its soundness;

5. Samples of the lining to determine its insulating properties, from which conclusions could be drawn as to the temperature to which the stack structure would be subjected;

6. Soil borings taken near the footings of the stack to determine capacity of the underlying soil;

7. Tests of the soil surrounding the footing and the footing concrete to determine the presence or absence of corrosive elements that could cause progresive deterioration of the concrete;

8. Core boring of the footing to determine the strength and condition of the concrete;

9. Complete structural analysis of the incinerator to determine that it meets all requirements of the ASME and State Codes for a fired pressure vessel;

10. Physical pressure tests of the cavity around the incinerator;

11. Preparation of a layout of the machinery and equipment, together with an analysis of all mechanical supply and exhaust air requirements; and

12. Determination of how the proposed operation expects to handle the destruction and/or removal of all the pollutants normally present in the recycled drums.

From the above tests, measurements and examinations, recommendations could be made regarding the structural capacity of the incinerator and stack and the possibility of repairs to restore them.

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Based upon our preliminary investigation and analysis, we believe that extensive work would be required to rehabilitate the existing facility so that it would be in compliance with the various Codes.

As called for in our Agreement, we have prepared an estimate for the above described Phase II work. The estimated fee, $20,000, includes gathering all material samples, testing, preparation of as-built drawings, analysis and a final report.

We trust that the information contained in this report is sufficient for your needs. If you have any questions or require additional information, please give us a call. It has been a pleasure to work with you on Phase I of this study. We are prepared to continue with Phase II upon receiving notice to proceed.

Very truly yours

Harold R. Sandberg
President

HRS:bjg

cc: Ms. April E. Wooden
Mr. William Burgess
Mr. John B. Dolio